1. A method to form a photoresist pedestal having inwardly sloping sidewalls, comprising:

depositing a layer of photoresist, having a top surface, on a substrate;

exposing said layer of photoresist to an electron beam pattern, thereby forming in the photoresist a latent image of a rectangular prism;

subjecting the photoresist to a first baking treatment followed by a first development treatment, thereby forming a pedestal having vertical sidewalls;

exposing said pedestal to a vertically applied flooded electron beam whereby an amount of acid is released from said sidewalls, said amount being greatest near said top surface and lowest near said substrate; and

then subjecting said photoresist pedestal to a second baking treatment followed by a second development treatment, whereby said sidewalls slope inwards and the pedestal is widest at said top surface and narrowest at said substrate.

2. The method described in claim 1 wherein said photoresist is a negative tone chemically amplified resist.

3. The method described in claim 1 wherein said the step of exposing said layer of photoresist to an electron beam pattern causes the photoresist to be exposed to an electron dose of between about 10 and 40 $\mu C/cm^2$.

4. The method described in claim 1 wherein said first baking treatment further comprises heating to a temperature between about 80 and 120 °C for between about 1 and 4 minutes.

5. The method described in claim 1 wherein said first development treatment further comprises immersing in a TMAH solution having a concentration between about 1 and 3 % for between about 10 and 60 seconds, thereby achieving optimum resolution.

6. The method described in claim 1 wherein said the step of exposing said layer of photoresist to a flooded electron beam causes the photoresist to be exposed to an electron dose of between about 10 and 40 $\mu C/cm^2$.

7. The method described in claim 1 wherein said second baking treatment further comprises heating to a temperature between about 80 and 120 °C for up to about 5 minutes.

8. The method described in claim 1 wherein said second development treatment further comprises immersing in a TMAH solution having a concentration between about 1 and 3 % for between about 10 and 60 seconds.

9. The method described in claim 1 wherein said sidewalls slope inwards at an angle

of up to about 60 degrees from vertical.

10. A method to form a photoresist pedestal having inwardly sloping sidewalls, comprising:

depositing a layer of photoresist, having a top surface, on a substrate;

exposing said layer of photoresist to an electron beam pattern, thereby forming in the photoresist a latent image of a rectangular prism;

subjecting the photoresist to a first baking treatment followed by a first development treatment, thereby forming a pedestal having vertical sidewalls;

exposing said pedestal to a flooded electron beam that is applied at an angle relative to vertical; and

then subjecting said photoresist pedestal to a second baking treatment followed by a second development treatment, whereby said sidewalls slope inwards by an amount so that the pedestal is widest at said top surface and narrowest at said substrate.

11. The method described in claim 10 wherein said angle at which said flooded electron beam is applied is used as a means to control said amount that said sidewalls slope inwards.

12. The method described in claim 10 wherein said photoresist is a negative tone chemically amplified resist.

13. The method described in claim 10 wherein said the step of exposing said layer of photoresist to an electron beam pattern causes the photoresist to be exposed to an electron dose of between about 10 and 40 $\mu C/cm^2$.

14. The method described in claim 10 wherein said first baking treatment further comprises heating to a temperature between about 80 and 120 °C for between about 1 and 4 minutes.

15. The method described in claim 10 wherein said first development treatment further comprises immersing in a TMAH solution having a concentration between about 1 and 3 % for between about 10 and 60 seconds, thereby achieving optimum resolution.

16. The method described in claim 10 wherein said the step of exposing said layer of photoresist to a flooded electron beam causes the photoresist to be exposed to an electron dose of between about 10 and 40 $\mu C/cm^2$.

17. The method described in claim 10 wherein said second baking treatment further comprises heating to a temperature between about 80 and 120 °C for up to about 5 minutes.

18. The method described in claim 10 wherein said second development treatment

further comprises immersing in a TMAH solution having a concentration between about 1 and 3 % for between about 10 and 60 seconds.

19. A process to manufacture a write pole for vertical magnetic recording, comprising:

depositing, onto a substrate, a layer of photoresist and forming therefrom a trapezoidal prism having inwardly sloping sidewalls and a top surface that is parallel to said substrate;

depositing a conformal coating of non-magnetic material to a thickness that is sufficient to fully enclose said trapezoidal prism;

planarizing until said top surface is just exposed;

then removing all photoresist thereby forming a mold;

coating the mold with a seed layer followed by deposition onto said seed layer of a layer of material having high magnetic moment to a thickness sufficient to overfill said mold; and

then planarizing until said seed layer is just removed, thereby forming said write pole.

20. The process described in claim 19 wherein said photoresist is a negative tone chemically amplified resist.

21. The process described in claim 19 wherein said layer of photoresist is deposited

to a thickness between about 0.1 and 0.3 microns.

22. The process described in claim 19 wherein said non-magnetic material is selected from the group consisting of aluminum oxide and silicon oxide.

23. The process described in claim 19 wherein said seed layer is selected from the group consisting of CoFe, NiFe, CoNiFe, and CoFeN

24. The process described in claim 19 wherein said seed layer is deposited to a thickness between about 100 and 500 Angstroms.

25. The process described in claim 19 wherein said layer of high magnetic moment is selected from the group consisting of CoFe, NiFe, CoNiFe, and CoFeX, where X is W, Mn, Ni, Mo, Ti, Nb, V, Cr, or C.

26. The process described in claim 19 wherein said high magnetic moment material has a saturation moment of at least kilogauss.

27. A write pole for vertical magnetic recording, comprising:

a trapezoidal prism of high magnetic moment material;

said trapezoidal prism having parallel top and bottom surfaces and inwardly

sloping sidewalls;

said parallel surfaces being a distance of between about 0.1 and 0.3 microns apart; and

said sidewalls having a slope, relative to vertical of up to about 60 degrees.

28. The write pole described in claim 27 wherein said high magnetic moment layer is selected from the group consisting of CoFe, NiFe, CoNiFe, and CoFeX, where X is W, Mn, Ni, Mo, Ti, Nb, V, Cr, or C.

29. The write pole described in claim 27 wherein said high magnetic moment material has a saturation moment of at least 21 kilogauss.

30. The write pole described in claim 27 wherein the bottom surface has linear dimensions less than about 0.1 by 0.1 microns.

31. A process to manufacture a write pole for vertical magnetic recording, comprising:

depositing, onto a substrate, a layer of photoresist and forming therefrom a trapezoidal prism having inwardly sloping sidewalls and a top surface that is parallel to said substrate;

depositing a conformal coating of non-magnetic material to a thickness that is

sufficient to fully enclose said trapezoidal prism;

planarizing until said top surface is just exposed;

then removing all photoresist thereby forming a mold;

filling said mold through sputter deposition of a layer of material having high magnetic moment to a thickness sufficient to overfill said mold; and

then planarizing, thereby forming said write pole.

32. The write pole described in claim 31 wherein said high magnetic moment layer is selected from the group consisting of CoFe, NiFe, CoNiFe, and CoFeX, where X is W, Mn, Ni, Mo, Ti, Nb, V, Cr, or C.

33. The write pole described in claim 31 wherein said high magnetic moment material has a saturation moment of at least 21 kilogauss.